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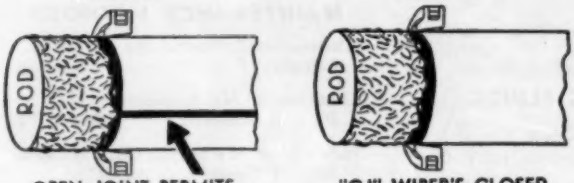


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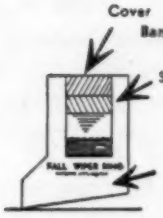


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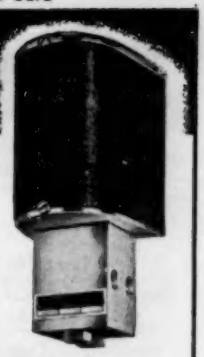

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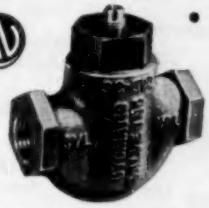

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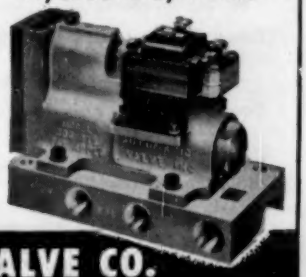

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## of Technical Manuals, Bulletins and Catalogs

. . . which have been listed
in APPLIED HYDRAULICS Magazine
during the last six months

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Any item (s) will be sent to you promptly if request is made on the postage-free Reader Service Card.

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Published March 1955

# Accumulators and Boosters

***AIR DRIVEN HYDRAULIC PUMP*** . . . designed for small volume capacity at low and high pressures is the subject of a new data sheet offered by The Aldrich Pump Company. Available in either single or double acting models, the pump develops up to 30,000 psi at 90 psi air supply, provides for such applications as testing tubing, valves and pressure vessels, and supplying power for small molding presses. The data sheet gives complete information on design, installation, operation and is illustrated by photographs, sectional and dimensional drawings.

Circle No. 1

***BOOSTERS, ACCUMULATORS*** . . . and air-hydraulic units are subject of an 8 page brochure released by Petch Manufacturing Company. The brochure also discusses air to oil and oil to oil cylinder type accumulators. Similar in application to bladder type accumulators but with the added advantage of a working pressure boost over the maintained back-up pressure. The well illustrated catalog features construction diagrams, circuits and a booster selector chart.

Circle No. 2

***HYDRO-PNEUMATIC ACCUMULATOR*** . . . that will cushion shock and vibration is described in Bulletin 1100, available from Greer Hydraulics, Inc. The complete assembly consists of a steel alloy shell, a synthetic compound separator bag incorporating an integrally molded air valve, and an oil port assembly. This component is especially recommended for mobile applications, and the brochure shows a typical accumulator installation on a fork truck and its operation.

Circle No. 3

***HIGH PRESSURE COMPONENTS*** . . . are featured in Martin-Decker Corp.'s 4-page bulletin, M-15. It illustrates a hydraulic pressure booster which, when connected to water and air supplies, can build up pressures as high as 25,000 psi. Simple to install, easy to operate, the unit has no motors, pumps or gears. Also shown are check valves, made of cold rolled steel, brass or stainless steel, available in working pressures up to 25,000 psi; and self-sealing couplings, designed to fit either male or female ¼ N.P.T. threads.

Circle No. 4

***AIR DRIVEN LIQUID PUMP*** . . . capable of developing pressures to 30,000 psi is described in a 4 page bulletin covering data on the Model S-216-C. The bulletin is available from Sprague Engineering Corporation. The pump may be incorporated directly into the design of all types of hydraulic machines. It may be used to replace electrically driven hydraulic pumps where the flow requirement is low. Operating characteristics, specifications and capacity data is included. Cutaway view shows the construction.

Circle No. 5

# Air Compressors

***"ORIGINAL EQUIPMENT APPLICATION IDEAS FOR PRODUCT DESIGNERS"*** . . . is the title of a new brochure by Gast Manufacturing Corp. Bulletin 1054-5 shows how 35 product component problems were solved with rotary air motors, air compressors and vacuum pumps manufactured by the company. Photographs of applications, together with detailed captions describing hp requirements, air pressure used, rpm of the unit and other data, are shown. Briefly described are also recent additions to the Gast line of original equipment components.

Circle No. 6

***AIR COMPRESSOR*** . . . of the Utility 105 cfm type has been placed back into the compressor line manufactured by Le Roi Company, after an absence of several years. A bulletin describes the new and improved features. Installation drawings show the width is 25 inches and the length only 82 inches. Photos show the compressor with and without removable lightweight expanded metal hood sides. Specifications for the compressor and engine, as well as a complete rundown on tool capacities are included.

Circle No. 7

***LOCATING AIR COMPRESSOR TROUBLES*** . . . in vertical, water cooler air compressors is subject of new bulletin L-676-M1, being offered by Worthington Corp. This is one of a series on preventive maintenance being issued by the company to assist in reducing costs of operation. It is designed to help operators of YC and DYC compressors detect existing troubles and be alert to ways these can be prevented. Graphically illustrated, it clearly explains reasons for such troubles as failure to deliver air, insufficient capacity, insufficient pressure, vibration, overheating, overloading motor, low or high intercooler pressure.

Circle No. 8

***PORTABLE AIR COMPRESSORS*** . . . developing high pressure, are described in product sheet No. 5, issued by The Cornelius Company. The 32 series has a pumping capacity of .6 cfm of free air. Will compress 25 cu ft of free air to 2500 psi in 45 minutes. The 130 series, has a pumping capacity of 2 cfm of free air. Will compress 25 cu ft of free air to 3000 psi in 15 minutes. Both series are air cooled, 3 stage design. Both have integral oil reservoirs and efficient interstage cooling.

Circle No. 9

***AIR COMPRESSORS . . .*** for industrial service are described in a 12 page catalog offered by Quincy Compressor Co. Dimensional and construction data is given for single stage single cylinder; two stage compressors; and both base and tank mounted compressors. Compressors feature honed cylinder walls, copper finned intercooler, cushioned steel valves and semi-steel pistons.

Circle No. 10

***HEAVY DUTY AIR COMPRESSORS . . .*** Joy Manufacturing Company has released a new 36 page bulletin A-72 on compressors for industry. The bulletin contains complete information on construction and operation of the compressor. Illustrated are seven models. Features of the units described include replaceable crosshead, cylinder liners and full force-feed lubrication.

Circle No. 11

## Cylinders and Fluid Motors

***AIR MOTORS AND VALVES . . .*** manufactured by The Bellows Company are featured in a 28-page bulletin, SP-50. This "Spec-Book" illustrates and describes completely dimensions and specifications of their air motors and valves. 75 illustrations and 27 specification charts help facilitate the application of these units. Charts give size and capacity designations. Accessory items are also included in the bulletin.

Circle No. 12

***AIR CYLINDERS . . .*** which feature built-in valves in the rear head are detailed in The A. K. Allen Co.'s new 4 page bulletin. Shown are Models SVA and SVE, available in 2 inch and 3 inch bores and any length of stroke up to 60 inches. The built-in valves are of the slider type, slider is actuated by a spool whose instantaneous motion is achieved through two bleeder valves. A choice of mounts is available for mounting cylinders in any position.

Circle No. 13

***PLUG VALVE ACTUATOR . . .*** for the remote control of all types and sizes of wrench-operated plug valves from 1 inch to 8 inches is described in an eight-page illustrated bulletin published by The Pantex Manufacturing Corporation. The company manufactures the complete unit, cylinder and actuator. It comes completely assembled ready to attach to pipe and plug valve stem. These actuators are designed for pneumatic operation, but provision can be made for hydraulic operation on special order. The unit will operate in any position at operating pressures from 30 to 125 psi. The bulletin is illustrated with photographs of typical installations, detailed line drawings and gives complete engineering data.

Circle No. 14

***HYDRAULIC CYLINDERS . . .*** for pressures up to 3000 psi are presented in catalog No. 741 released by Hydraulic Power Division, The Hydraulic Press Mfg. Company. The catalog is very complete and covers all material thoroughly. Many different mountings are illustrated and dimensioned for installation purposes. Features and cut-a-way view of the cylinder are included. Other subjects discussed are single acting cylinders, telescoping cylinders, large bore cylinders, special cylinders, accessories and capacities.

Circle No. 15

***PLUG VALVE ACTUATORS . . .*** pneumatically and hydraulically operated for remote controls and automatic processing, are the subject of an 8 page bulletin 3020, released by Ledeen Mfg. Co. Designed for installations either on new valves or on existing valves already in service. Air, oil or water actuators are available. Direct or remote control by hand or pilot operated valves. Suitable for most control requirements including instrument controls. Applications, mountings and dimensions are also included.

Circle No. 16

***HYDRAULIC CRANKING MOTOR . . .*** known as the Hydrotor, provides a higher and hitherto unobtainable stored starting capacity in a unit of comparable size. The unit operates in a closed hydraulic system completely independent from batteries and does not require regular maintenance checks. The essential features of the Hydrotor which is made in three sizes are illustrated and described in a folder published by Hydramotive, Inc.

Circle No. 17

***POWER JACKS . . .*** The majority of machining, grinding, welding, riveting, drilling and many other operations on irregular shaped pieces, necessitates some sort of a fixture to support the piece in the desired position. A bulletin, released by Power Jacks, Ltd. describes a clamping device which provides a simple means of holding work. The system comprises a hand operating hydraulic pump, and one or more hydraulically operated plungers.

Circle No. 18

***CYLINDERS . . .*** for air and hydraulic operation featuring unusually large capacity to size ratio are explained in catalog No. 750 offered by Hanna Engineering Works. The catalog consists of 16 pages and is filled with information about cylinders. A cross section view shows the construction and features. Various mountings are illustrated and dimensional data given for the mountings will assist in preparing machine layout drawings. Both push and pull forces are given in a capacity chart for each cylinder size at various pressures between 30 psi and 750 psi.

Circle No. 19

***AIR AND HYDRAULIC CYLINDERS . . .*** in popular sizes and mountings are now carried in stock by Miller Fluid Power Co. A 12 page booklet, "A Cylinder Program for Automation and Heavy Duty Dependable Service" describes this service, and gives mounting dimensions of their 200 psi air cylinders and their 2000 psi hydraulic cylinders. Along with this information are dimensions of other sources which wholly or partially conform to the Miller line. A large cross sectional view of both cylinder types, shows the construction of the cylinder and various features of the component parts.

Circle No. 20

**HONING OF CYLINDERS . . .** to customer's specifications is American Hollow Boring Co.'s specialty. A four page bulletin describes and illustrates its facilities and examples of their products. Equipped to manufacture cylinders from 1¼ inch to 15 inch I.D. and 27 feet in length, they can be furnished in seamless tubing, with welded flanges and bases and from solid bar stock. Exacting tolerances and honed finish are rigidly maintained.

Circle No. 21

**HYDRAULIC CYLINDERS . . .** for low pressures are presented in a 4 page folder released by Rotex Punch Co., Inc. Available in bore sizes of 1⅛, 2, 3 and 4 in bores, they are supplied in non-cushioned and cushioned models. The cushioned model is not available in 1⅛ in size. Complete mounting data is given for the standard size cylinders. Six mountings are illustrated, base, foot, flange, pivot, clevis and nose. Installation data is given for each of them. A chart shows the load capacity of cylinders, for various pressures.

Circle No. 22

**SLIDERULE CALCULATOR . . .** for selecting air hydraulic cylinders is available from Air and Hydraulic Division, Lindberg Engineering Company. A time saving tool it provides quick information on cylinder diameters, areas, pressures, forces and displacements.

Circle No. 23

## Electrical Components

**TIMERS . . .** a vital part in modern industries new trend to automatic manufacturing is the subject of a new 12 page booklet, Form 354 released by Eagle Signal Corporation. Many of the company's products used in solving the problem of relating and coordinating machines and processes automatically, are completely described. Several reset timers and repeating cycle timers are illustrated and the features and operation of each are given.

Circle No. 24

**PRESSURE SWITCH . . .** for on-off control of aircraft and mobile pressurizing pumps is described in a catalog sheet available from United Electric Controls Company. The unit provides a positive switching action in response to source pressure variations independent of atmospheric pressures and temperatures. All features, applications, operation, electrical connections, outline dimensions, and adjustment are completely detailed. Ordering information is included.

Circle No. 25

**SOLENOIDS . . .** of a newly designed line, manufactured by Joseph Pollak Corporation are described in a new catalog. Light-weight and compact in design, the solenoids are available in a wide variety of mountings, coils and wire sizes. Three hundred different types of custom solenoids may be assembled from twenty standard parts. An unusual features of this line, series 100 and 300, is simplified change-over to push or pull type by adding a threaded 3/32 inch diameter push rod to any plunger. The catalog includes performance curves and typical coil data.

Circle No. 26

**ELECTRIC TIMING DEVICES . . .** are described in catalogs and engineering bulletins made available by Haydon Manufacturing Co., Inc., Catalog No. 322 describes several series of timing motors which are suitable for any application. Catalog No. 323 outlines the timing devices available, including time delay relays, reset timers, interval timers, elapsed time indicators, fixed interval repeat cycle timer and direct current timers. Catalog No. 324 covers the clock movements available.

Circle No. 27

**ENCLOSED WIRING BOXES . . .** manufactured to J.I.C. standards are described in literature available from Hoffman Engineering Corporation. Protection to electrical equipment and wiring is assured as the boxes are oil and dust tight. There are no knockouts or holes. Relays and timers can be mounted in the box, as the box is equipped with a removable panel for this purpose. All dimensions are included for the various models which are available, showing box and panel size, mounting holes and overall dimensions.

Circle No. 28

**"SWITCHES FOR INDUSTRY" . . .** is the title of a newly published catalog, available from Micro Switch, a division of Minneapolis-Honeywell Regulator Co. Catalog 101 consists of 20 pages, in color and covers 22 different types of switches, describing 258 different switches, actuators and enclosures. Photos are used to show outside dimensions. Characteristics, electrical ratings and technical data are so arranged as to aid the designer in the selection of the correct switch for his application. The products described range from postage stamp size "V-3" to heavy duty "ML" limit switches.

Circle No. 29

**ELECTRIC RELAYS . . .** Six relays are presented in a 4 page folder made available from Sigma Instruments, Inc. Duplicate information is given for each of the types; this includes rating, sensitivity, maximum coil resistance, coil dissipation, speed range; mountings, enclosures and designations; and features. The relay series covered in the bulletin include, dc relays; ac and dc relays; dc relays midget; dc relays-polar and dc relays-polar, telegraph keying.

Circle No. 30

***LIMIT SWITCHES*** . . . designed to meet severe mechanical and electrical conditions imposed by heavy duty machines are the subject of a folder prepared by Electrical Mfg. Division, The National Acme Company. Literature shows the various types of limit switches available, design features, specifications, wiring diagrams and ordering data. Also included are other electrical components and controls.

Circle No. 31

***TIMING RELAYS*** . . . are covered in a 16-page bulletin offered by Allen-Bradley Company. Described and illustrated are four different types of relays, fluid dashpot timing relays, pneumatic timing relays, process timers and electronic timing relays. Features, operation, engineering data and applications are given for each unit. Factors to be considered when selecting timing relays are also outlined.

Circle No. 32

## Electric Motors

***ELECTRIC MOTORS*** . . . which conform to the new NEMA Standards for mounting dimensions and frame assignments for integral horsepower motors are shown in bulletin No. 1600 published by The Louis Allis Co. Comparison of principal dimension between old and new frames are charted for the 1—40 hp induction motors.

Circle No. 33

***ELECTRIC MOTORS*** . . . of the new Series 100 are the subject of Howell Electric Motor Company's new bulletin. This line of motors, re-rated according to new NEMA designs, introduces smaller frame diameters for a-c motors, 1 to 30 hp, saving considerable weight and space. The bulletin states that because of new improved insulation, better motor design and ventilation, heat is dissipated more effectively. The brochure includes dimensions and data of new frame sizes.

Circle No. 34

***ELECTRIC POWER DRIVES*** . . . are presented in a new 8 page application tabloid bulletin, released by Sterling Electric Motors, Inc. Brochure presents 60 photographs on power drives for machinery and many other kinds of equipment. Pages have been divided by industries, and include application stories from food, metal, chemical, petroleum, plastic, paper, printing, lumber and textile industries.

Circle No. 35

***ELECTRIC MOTORS*** . . . Performance tests of different brands of electric motors and their results are published in a 4 page brochure. Offered by The Electro Dynamic Motor Generator Division of the General Dynamics Corporation, the booklet presents the information in tabular form for engineering performance, and comparison, in visual color charts, as to what the results prove in relation to use.

Circle No. 36

***ELECTRIC MOTORS*** . . . manufactured by U.S. Electrical Motors Inc., are featured in a new multicolored booklet. It presents the 20 principal types, including uniclosed, totally-enclosed, explosion proof with and without fan, combination variable speed and internally geared units. Cutaway views of Varidrive and Syncrogear types are shown in full color. Also given are details on Lubriflush transverse bearing lubrication, asbestos-protected windings and normalized motor castings.

Circle No. 37

## Filters

***HYDRAULIC OIL FILTER*** . . . with a built-in bypass is described in literature available from Bendix-Skinner Division of Bendix Aviation Corp. Of sturdy aluminum die cast construction, the filter is available with either cleanable ribbon type elements for 40-micron filtration or replaceable pleated type for 10-micron filtration.

Circle No. 38

***SYNCLINAL FILTERS*** . . . manufactured by Marvel Engineering Co. are featured in catalog No. 106. Illustrated are sump type and line type filters, their parts listed and complete engineering data included. Theoretical flow and pressure drop table and standard viscosity temperature charts are also given.

Circle No. 39

***INDUSTRIAL FILTERS*** . . . A new 8 page catalog No. AK050 has been published by The Cuno Engineering Corp. which describes the full line of filters. Positive filtration is obtained by passing a fluid, containing solids, between discs, placed edgewise to the flow. These discs are on a center support rod, separated from each other by a spacer. The thickness of this spacer determines the degree of filtration. Specifications and capacities are given for all models having flow rates between 1 and 3760 gpm and operating pressures of 125 psi.

Circle No. 40

***HYDRAULIC FILTERS*** . . . with radial fin insert are the subject of Bulletin HF-2 published by Dollinger Corporation. The unit is of simple design, only three major parts, lower end plate, insert and combined supporting tube and upper end plate with threaded outlet sleeve. Complete specifications and application data are given.

Circle No. 41

***OIL FILTERS AND PURIFIERS . . .*** illustrated in a new bulletin, demonstrates how these units are presently used and suggests additional and similar applications in pipe line and industrial fuel and lubricating oils. Prepared by Purifier Division, Hilliard Corporation, the bulletin describes newer installations for lubricating and non-lubricating oils in transformers, circuit breakers, heat treating, wire drawing and hydraulics.

Circle No. 42

***HIGH PRESSURE FILTERS . . .*** The Trabon Engineering Corp. has published a 2 page bulletin No. 545, on their high pressure lubrication filters. They are constructed of high tensile cast aluminum with steel sump and tie rod and are built to withstand 1000 psi working pressure and 1800 psi test pressure. The bulletin includes dimensional material, illustrations, diagrams and comprehensive flow loss charts.

Circle No. 43

## Heat Exchangers

***HEAT EXCHANGERS . . .*** of the "F" shell and tube type, made by Young Radiator Company, are described in their new catalog No. 1245. This 12 page, two color, brochure contains application photographs covering a wide range of industries, presents materials, construction features, dimension drawings and tables. Four pages of the catalog are devoted to a simple, complete guide to heat exchanger selection. This data includes all necessary tables and formulas for selecting exchangers involving the most common cases of water-to-water and water-to-oil heat transfer.

Circle No. 44

***PLATE TYPE OIL COOLER . . .*** is featured in a 4 page bulletin prepared by Harrison Radiator Division, General Motors Corp. Design and construction of this unit is outlined, photographs show parts and assembly.

Circle No. 45

***AFTERCOOLERS . . .*** A 4 page folder, describing a water cooled aftercooler for removing oil and moisture from compressed air systems from 100 to 500 cfm, is available from The Heat-X-Changer Co., Inc. Use of longitudinal inner-fins permits maximum heat transfer with minimum pressure drop. The booklet is well illustrated, showing construction and dimensions.

Circle No. 46

***HEAT EXCHANGER . . .*** Bulletin No. 120 prepared by Niagara Blower Co., describes the operation of the heat exchanger used in cooling or controlling of temperatures of industrial liquids. It shows the operation of this equipment by means of diagrams and examples of application by installation photos. Included is a large cut-a-way view showing the construction.

Circle No. 47

## Hydraulic Oils

***INDUSTRIAL OIL HYDRAULICS BOOKLET . . .*** is a handsome 22 page multi colored text published by Cities Service Petroleum, Inc. The first chapter gives a brief introduction to the meaning of hydraulics and its ever growing application in industry. The principles of hydraulics described and illustrated with drawings show how force is developed and the building of the system. Pumps, valves, accumulators and cylinders, fluid couplings, torque converters and typical hydraulic circuits are explained. The chapter on hydraulic oil stresses the seven important factors to consider in hydraulic oil selection, also covers filtering and cleaning procedures. A list of oils and recommended applications completes this booklet which should be a handy reference edition for those who design, operate and maintain industrial oil hydraulic equipment.

Circle No. 48

***FLAME RESISTANT FLUID . . .*** An eight page booklet on Lindol HF hydraulic fluid has been released by the Chemical Division of Celanese Corporation of America. The hydraulic attributes of the fluid are stated, physical properties and specifications given. Uses, application and installation information are included.

Circle No. 49

***EXTREME PRESSURE LUBRICANT . . .*** is a lithium base product containing Molykote molybdenum disulphide powder. Bulletin 101, prepared by The Alpha Corp. carries the specifications covering the lubricant and prices. The lubricant is suitable for use in highly-loaded ball and roller bearings and on heavily-loaded sliding friction surfaces. It is oxidation inhibited and has an operating temperature range from –30 F. to 350 F. The bulletin is in two colors and contains interesting information concerning the product.

Circle No. 50

***HYDRAULIC FLUID . . .*** for industrial and aircraft use is described in a 12 page brochure published by Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corp. Known as Ucon Hydrolubes, the literature lists how to use this fire resistant fluid and its advantages.

Circle No. 51

***AIRCRAFT HYDRAULIC FLUID*** . . . its advantages, properties and conversion costs, are discussed in a new 16 page revised booklet. This publication, prepared by Monsanto Chemical Company's Organic Chemicals Division, states that present systems can be converted readily to fire-resistant Skydrol by a minimum of aircraft processing and material changes. The booklet also includes a sample itemized tabulation of man-hours required for conversion at either the 8,000-hour overhaul or pattern overhaul period.

Circle No. 52

***NON-FLAMMABLE SAFETY PACKAGE*** . . . which consists of a group of processing products that are safe to use in the vicinity of fire and intensive heat, is described in an 8 page folder available from E. F. Houghton & Co. One of the products presented is their non-flammable hydraulic fluid. It will not burn or explode. They produce a rust preventative, safe water solution which cleans at room temperature and an all purpose water-soluble cutting base.

Circle No. 53

***HYDRAULIC OILS*** . . . their selection and use is discussed in a new three color catalog designed to aid consumers in making the proper choice of oils. Issued by The Denison Engineering Co., Bulletin No. 45 contains 15 pages and presents all the facts about hydraulic oils and the importance of carefully selecting the one suitable for each operation. Some of the sections of the bulletin reveal "Factors Affecting Hydraulic Oil Performance" and "Procedure to Assure Suitable Oil Condition." The catalog is well illustrated with photographs and charts.

Circle No. 54

## Instruments

***MEASURING AND CONTROL INSTRUMENTS*** . . . A new general 12 page catalog illustrates a complete line of process instrumentation available from Fischer & Porter Company. It gives basic specifications and descriptions of pressure and temperature instruments; density and specific gravity measuring instruments; liquid level instruments; electric, pneumatic, and electronic transmitting, recording and controlling instruments with alarms and integrators. Also featured are air-operated control valves in various models and construction materials. One section of the catalog is devoted to centralized control panels, data reduction and automation systems, and other instrumentation packages.

Circle No. 55

***LEVEL INDICATOR*** . . . for application with most non-adhesive chemicals, oils, is the subject of a leaflet offered by Thermo Instrument Co. This meter-indicating level monitor derives its signal from an inert capacitive-type sensing probe. Specifications show that the instrument can be operated from high vacuum to pressures as high as 100,000 psi. Data included illustrates uses of the unit in remote indicating applications where the repeat meter can be located at a practically unlimited distance from the main sensing installation.

Circle No. 56

***HAND TACHOMETERS*** . . . Metron Instrument Company's new bulletin covers the new 3 in 1 hand tachometer which dependably measures the speeds of rotating parts and moving surfaces. The 3 in 1 has three separate ranges in one instrument. Only one range appears at a time, therefore minimizing reading errors. Ranges are selected by merely flipping a handy switch. There is no fear of damage due to overspeeding or selection of the wrong range.

Circle No. 57

***TEMPERATURE TEST CHAMBER*** . . . is designed for the convenience of research workers and the small laboratory unit. Freedom from delays attendant upon scheduling time in larger chambers permits extensive performance of ambient temperature variation tests, reserving the larger equipment for more elaborate environmental testing. Portable and self-contained, it is suited to production line tests of small products. A folder, offered by Statham Development Corp. explains operating instructions and procedure in addition to specifications.

Circle No. 58

***FLOWMETER*** . . . A bulletin, one of a series prepared for the benefit of flow meter users in the automotive, aircraft, chemical and petroleum industries, is No. 1053 prepared by Commercial Research Laboratories, Inc. The bulletin includes major design and construction features of the type 12-100 series unit, maximum flow ranges, and various combinations of metering tubes and by-pass valves which can be used in series. Complete mounting drawings are available. The use of logarithmic rather than the usual linear type scale markings greatly increase the accuracy and readability.

Circle No. 59

***PRESSURE GAUGES*** . . . for various applications are described in Catalog M-5 available from Acragage Corp. It shows construction details of gauges available with a choice of Bourdon spring material dependent on the type of corrosion resistance required and the pressure range of the gauge. Also featured are solid front case gauges, phenol case gauges, electric transmitter gauges. Standard gauge dial graduations, net weights and mounting dimensions are listed.

Circle No. 60

***GAGE GUARD*** . . . to protect sensitive pressure instruments is featured in literature offered by Industrial Engineering Corp. Installed simply in the line between the pressure instrument and the source of pressure, the unit is designed to cut off and prevent further pressure increase at the gage or manometer whenever the source of pressure exceeds the pre-selected cut-off point, and to withstand and hold closed up to 10,000 psig regardless of cut-off setting. The two available models are illustrated and complete engineering data listed.

Circle No. 61

***OIL TEMPERATURE REGULATORS . . .*** are covered in a 12 page catalog, showing the whys and hows of temperature ranges and installation musts. Published by Lawler Automatic Controls, Inc., the catalog explains where and when to use direct acting, reverse acting, three way type thermostatic temperature regulators and lists typical engineering specifications. Illustrated with cut-away photos, diagrams, installation diagrams and engineering tables, the bulletin also details special product features.

Circle No. 62

***CONTROL INSTRUMENTS . . .*** United States Gauge, Division of American Machine and Metals, Inc., published a 4-page Bulletin, GL-1, featuring the Gotham line of indicating, recording and controlling instruments. The bulletin also covers portable running time-temperature recorders, pneumatic off-on indicating controllers and pneumatic proportional recorders for 1 to 100 per cent proportional band.

Circle No. 63

***DIAL THERMOMETERS . . .*** for many different uses, are presented in an 8 page bulletin, Form DT-1-54, published by Rochester Manufacturing Company, Inc. Industrial, laboratory, heavy duty industrial, heavy duty for petroleum and chemical service, and straight form thermometers are all discussed. The features of each type, a complete description of the dial assembly, immersion depth, accuracy and range are included.

Circle No. 64

***PNEUMATIC TIMERS . . .*** Timing relays for either ac or dc power systems are discussed in bulletin No. 225, available from Square D Company. Many timers, for a variety of applications, are illustrated. A cut-a-way view illustrates the operation. A selection table is also included. Planned to aid in the selection of a unit when certain operating conditions are desired.

Circle No. 65

***LINEAR ACCELEROMETERS . . .*** suitable for static and dynamic measurements are described in bulletin AL-1 available from Statham Laboratories, Inc. The resistive nature of the balanced four arm bridge permits operation in either dc or ac circuits, so that a wide range of recording, telemetering and controlling systems may be employed. General specifications and the characteristics of the various models are included.

Circle No. 66

## Mechanical Devices

***AIR-GRIP CLUTCH . . .*** for press operation is outlined in a 4-page folder available from Dodge Manufacturing Corp. Embodying several new features, this clutch operates at air pressures up to 150 psi. A cross section drawing shows internal construction. Information is given on air control, release valves, clutch sizes, bore sizes and weights.

Circle No. 67

***FLEXIBLE COUPLINGS . . .*** which will connect electric motors to drive pumps, are described in an eight page catalog No. 55. It illustrates gear type couplings of standard and special types, Francke couplings, cut-out pulleys and junior gear coupling. The catalog, prepared by John Waldron Corporation, gives complete specifications such as working torque range, bore limits, dimensions and shipping weights.

Circle No. 68

***CHAIN DRIVES . . .*** for 50 to 5,000 hp drive applications are outlined in a six page catalog folder available from Morse Chain Company. The folder, which is water and oil-proof plastic material, has complete line drawings and descriptive material dealing with such subjects as sprocket installation, chain assembly, chain cases, lubrication, chain disassembly and maintenance procedures. The folder describes in detail disassembly procedures for both washer-type and spring-lock type connecting links.

Circle No. 69

***TRANSMISSION BELT . . .*** known as Poly-V drive is discussed in a new brochure, #6638, available from Raybestos Manhatten's Rubber Division. Design characteristics of the single, endless belt with molded lengthwise ribs, are explained in two-color line drawings which show why fourteen specific advantages are claimed for the drive. The brochure uses V-belts and sheaves as a standard for comparison of Poly-V with conventional drive. Text and illustrations show in detail why the drive gives twice the contact area, 50 percent more horsepower, eliminates matching and reduces inventory of belts and sheaves.

Circle No. 70

***CYLINDRICAL ROLLER BEARINGS . . .*** are the subject of a new catalog, TR-854-C, issued by Rollway Bearing Company. It lists types, sizes, dimensions and load ratings. Detailed are crowned rollers, a feature which relieves high stress areas at the roller ends. A formula for load ratings and a method for calculating expected bearing life are included in this literature.

Circle No. 71

***FLEXIBLE COUPLINGS . . .*** of the rubber-bronze bushing type are the subject of a selection guide prepared by Ajax Flexible Coupling Co., Inc. This selection guide, Bulletin 57, gives complete ratings, drawings, specifications, service factors and various uses of the types illustrated. This pocket size brochure also shows that the flexible rubber bushings provide necessary freedom of movement between each flange, and a cushioned drive in both directions of rotation.

Circle No. 72

***OVER-RUNNING CLUTCH AND COUPLING . . .*** their construction and operating characteristics are outlined in Bulletin No. 231, offered by The Hilliard Corporation. Various types of clutches are featured together with sectional drawings and complete technical specifications.

Circle No. 73

**"FOR GREATER EFFICIENCY"** . . . is the title of booklet featuring shock and vibration isolators. The bulletin, prepared by Barry Corporation, discusses the problems of greater utilization of capital equipment, methods of pin-pointing and overcoming sources of inefficient plant and machinery operation. Based on an extensive survey, literature discusses eight steps in attaining efficiency objectives.

Circle No. 74

# Packings

**"CUSTOMIZED RUBBER ENGINEERING"** . . . is the title of a folder which shows what happens when you bring hydraulic sealing problems to Plastic and Rubber Products Company. Folder features in cartoon style how the company is able to design and custom produce a part with fine finish and close dimensional tolerances. Their engineering, testing, mixing and molding facilities enable the company to tailor make rubber requirements for hydraulic, pneumatic, aircraft, automotive, machine tool and many other applications.

Circle No. 75

**GROMMETS** . . . made in a wide range of proven rubber, synthetic rubber and silicone rubber compounds are listed in a 16 page file folder released by Goshen Rubber Co., Inc. The line includes the compelte Air Force-Navy Standard AN931 grommet series, 34 basic sizes, each size available with 1/16, ⅛, 3/16, and ¼ inch groove width, and the 34 sizes in the web type with 1/16 inch groove width.

Circle No. 76

**O-RINGS** . . . for general industrial hydraulic fluids as well as water and air service are illustrated in a new four page folder. Manufactured by Stillman Rubber Co., these O-rings are precision molded of Buna N fuel and oil resistant compounds. They are available in a complete range of standard sizes, and special sizes for industrial use.

Circle No. 77

**PACKINGS** . . . are the subject of a comprehensive circular showing diagrams and tables dealing with homogeneous, leather and fabric V-packings, homogeneous synthetic rubber U-cups and fabric cup packings. Molds have been developed whereby the V-packings of the 3 types are completely interchangeable with one another without upsetting the overall stack height of the set of packings. Bulletin No. 207 is available from Chicago Belting Co.

Circle No. 78

**SEAL-GUARD** . . . as a protection for hydraulic packings, wipes off dirt. How the rings remove sand, grit, paint, chips and other foreign material is described in a bulletin offered by Hydraulic Accessories Company. Sketches are included which show the most common applications. A chart shows complete dimensions for each seal-guard.

Circle No. 79

**RUBBER AND LEATHER PACKINGS** . . . Six new technical bulletins, each featuring essential data on individual types of packings have been issued by E. F. Houghton & Co. Compiled to save time for designers, engineers and maintenance departments, each bulletin contains factual information and standard sizes for only one specific style of packing. The leaflets on leather packings also include data on new rubber impregnated leather.

Circle No. 80

**PACKING SELECTOR SLIDERULE** . . . which will pick out the right packing for almost any application is offered by New York Belting and Packing Co. The selector, a cardboard disc six inches in diameter shows packing styles, pressure and temperature reading for the four types of packing applications, gaskets, valve stems, centrifugal and reciprocating pumps. The material being handled is printed alongside a window in a second and smaller disc mounted on the larger one. The reverse side of the wheel gives the sizes in which the recommended packing is available.

Circle No. 81

**PACKINGS** . . . recommended for reciprocating and centrifugal pumps are given in a folder prepared by Johns-Manville. The ten types of packings shown have been developed to meet a wide range of industrial packing requirements. According to this folder coil and spiral packings are most economical for maintenance purposes because rings for many different stuffing boxes can be cut from the same coil and spiral. A table lists the best recommendations for a number of conditions and applications.

Circle No. 82

**INDUSTRIAL RUBBER PRODUCTS** . . . made by Quaker Rubber Corporation, Division of H. K. Porter Company, Inc., are illustrated in a new 58-page general catalog. The catalog is divided into sections for quick reference to a product. There are sections on packings, hose, belting and molded rubber products. Each product described is illustrated in a cut-away section. Performance data, specifications, working pressures, weights and all technical information is given. There is also complete information on different types of hose couplings.

Circle No. 83

**HOMOGENEOUS "V" RINGS** . . . recommended for hydraulic and pneumatic applications for pressures not in excess of 5000 psi are described in an 8 page bulletin released by Raybestos-Manhattan, Inc. These "V" rings made from two types of synthetic rubber are low in friction and low swelling. Complete information is given on sizes available for each diameter of rod or ram. A diagram shows the method of determining the number of rings required for a flat installation. Standard sizes for homogeneous "V" packing rings are given. Also information is given on the characteristics and features.

Circle No. 84

***SYNTHETIC PACKINGS*** . . . made of Kelon, a new fluoroplastic material that provides many important advantages in applications of adverse chemical, electrical and physical environments are discussed in a 4 page two-color catalog offered by W. S. Shamban & Co. The company's modern facilities are also described.

Circle No. 85

***SILICONE PRODUCTS REFERENCE GUIDE*** . . . published by Dow Corning Corporation will help give engineers a maximum amount of information on silicones in limited space. The 1955 guide lists some 23 new products besides the 100 odd mentioned in previous issues. Still retained is the "division by application" method of listing individual products, helping engineers to locate a product by what it does rather than what it is. The application index has been increased from 17 to 21 classifications. The guide contains many tables, graphs and photos.

Circle No. 86

***O-RING*** . . . for aircraft hydraulic service, with a temperature range of minus 65 degrees to plus 400 degrees Fahrenheit has been developed by Parker Appliance Company. This new rubber material meets Military specifications MIL-P-5516A and MIL-P-18017. A spec sheet is available.

Circle No. 87

***LATTICE BRAID PACKING*** . . . for rods and shafts, are described in an 8 page folder issued by The Garlock Packing Company. Just how this packing is made, is shown with illustrations. In these packings the "through and through" braiding makes each strand flexible, so there is no stress when rings are formed. Features and general recommendations for various types of service are included. Available in sizes from ¼ in to 1 in.

Circle No. 88

***PISTON ROD BOOTS*** . . . can be fabricated from two or more weights of materials to meet specified operating conditions in the protecting of air and hydraulic cylinders. Bulletin SPC-1, released by A & A Mfg. Co. explains that the parts are fabricated from a neoprene-base material, which is impervious to oil, grease and water and withstands temperature extremes –60 F to 220 F without cracking.

Circle No. 89

***SYNTHETIC RUBBER "O" RINGS*** . . . Bulletin OB-1152, prepared by United States Gasket Co. completely describes the company's line of "O" rings and back-up rings. Illustrations show the operation of "O" rings with and without back-up rings at increasing pressures. Information is given on how to order the "O" rings and back-up rings. All standard sizes are listed. Included also are the nominal and actual dimensions.

Circle No. 90

## Pumps

***HYDRAULIC GEAR PUMP*** . . . A data sheet, released by Pesco Products Div., Borg-Warner Corp., describes this high pressure positive displacement pump. Capacity for pressures of 2000 psi at 2400 rpm is 11 gpm. An outline drawing showing dimensions may be used for installations. Engineering charts are included showing capacity vs pump speed, hp vs pump speed, and volumetric efficiency vs pump speed.

Circle No. 91

***AIRCRAFT PUMPS*** . . . the story of their manufacture is illustrated in an attractive 20 page booklet entitled "The Lear-Romec Story". It describes and pictures the company's engineering and production facilities and its modern test equipment and scientific methods which insure the excellence of product. Two pages show the aircraft to which the company supplies their manufacture.

Circle No. 92

***POSITIVE DISPLACEMENT PUMP*** . . . of new design, introduces a controlled floating vane. Circon Pump Company prepared a specification sheet outlining the features of this pump, in which the floating vanes can be controlled both radially and laterally.

Circle No. 93

***PLUNGER PUMPS*** . . . A new bulletin W-414-B45 on vertical triplex, single action plunger pumps is now available from Worthington Corp. Graphically illustrated by photos, charts, and line drawings, the bulletin contains information about features, applications, ratings, dimensions and specifications. Interchangeable plunger sizes, individual valve covers and flanged suction and discharge openings, stuffing box drains and automatic oiling system are some of the features discussed.

Circle No. 94

***HYDRAULIC HAND PUMP*** . . . for easy and efficient power application to hydraulic systems is detailed in a new 4 page bulletin. Published by Dowty Hydraulic Units Limited. The bulletin shows dimensional drawings, operational data and a sectional view of the unit. Literature states that with alternative connections and pressures variable from 500 to 4,000 psi, the pump can be adapted to suit a wide range of individual requirements.

Circle No. 95

***FLUID POWER EQUIPMENT*** . . . manufactured by The Oilgear Company is detailed and illustrated in a new 12-page bulletin, 10051-D. Literature shows pumps, motors, transmissions, cylinders, valves and accessories. Also featured are a new electric-hydraulic servo control system for pumps and transmissions up to 150 hp, a new line of Oilgearducers for constant torque drives.

Circle No. 96

***HYDRAULIC POWER UNIT*** . . . previously offered in pressure ranges from 250 to 1000 psi is now available in higher pressure ranges, from 1200 to 2000 psi. Manufactured by Logansport Machine Company, Inc., they describe the engineering changes of the unit, Model 6031, in a new catalog which shows complete data.

Circle No. 97

***CENTRIFUGAL PUMPS . . .*** in ranges from ⅛ to ¾ hp, from 6 to 65 psi and handle up to 70 gpm are described in a 12 page catalog prepared by Eastern Industries, Inc. This easy to read catalog offers helpful engineering data, specifications on all models, performance diagrams, dimensional drawings, instructions on stuffing boxes and mounting diagrams.

Circle No. 98

***HYDRAULIC POWER UNITS . . .*** groups hydraulic equipment such as reservoir, motor, pump and control valves, into a single unit to simplify and improve the overall design of a machine. Catalog C-102, issued by Hydraulic Power Equipment Co. describes standard power units, which includes a small series, medium series and heavy duty units. Custom designed units are also included. Outline drawings and tables show tank dimensions, capacity in gallons, gpm, and motor hp.

Circle No. 99

***HYDRAULIC COMPONENTS . . .*** motors, gear-type pumps, valves, cylinders, valve and pump combinations for up to 1000 psi working pressure are presented in a catalog available from Wisconsin Hydraulics, Inc. The motors and pumps in a number of mounting variations are available in sizes ranging from 8 to 22 gpm. Large diameter single and double acting cylinders, in sizes from 5 to 8 inch diameters, are shown together with operating pressures and dimensions in convenient chart form.

Circle No. 100

***DOUBLE PUMPS WITH VALVE PANELS . . .*** are integral units designed to meet demands for fluid power at 2000 psi for the operation of circuits calling for a substantial variation in pump volume as during "close and hold" or "traverse and feed" cycles. Bulletin No. DP-308, released by Dudco Division, The New York Air Brake Company, describes the design and features. Unit consists of two standard 2000 psi pumping cartridge assemblies within a single compact housing. Valve panels mount directly on the discharge ports of the double pumps. Fluid power can be supplied either to two separate systems or to a single two pressure circuit, controlled automatically.

Circle No. 101

***GEAR TYPE PUMPS . . .*** which are oil hydraulic and pressure balanced for heavy duty machine tools are described in Bulletin No. 142 issued by Hydreco Division, The New York Air Brake Co. The series H pumps are designed for heavy duty machine tools, materials handling and earth moving equipment. A chart gives performance details on all four pumps, cutaway drawings show construction details.

Circle No. 102

***HYDRAULIC MACHINERY AND EQUIPMENT . . .*** This 28-page, file size booklet, issued by The Hydraulic Association contains a check list of the products of the fourteen member firms. Many of these firms represent over a century of experience in the development of hydraulic equipment. Both components and typical machines, presses and equipment to which hydraulic systems are applied, are listed. The Hydraulic Association of Great Britain is a group of leading British manufacturers in the hydraulic equipment field.

Circle No. 103

***GEAR TYPE HYDRAULIC PUMP . . .*** The unit employs a patented pressure balancing system. For pressure deliveries up to 2000 psi, the range includes four sizes of pumps. A chart shows delivery (gpm) of each model pump both clockwise and counter-clockwise at 1500 rpm. A cross section view shows construction and arrangement of parts. Bulletin D.A.2/1 available from Dowty Auto Units, Ltd.

Circle No. 104

***PUMPS, VALVES . . .*** and complete power packages manufactured by Simplex Engineering Co., are the subject of a new bulletin G. The pumps, of the LA Series, are fixed displacement radial piston pumps built on an improved design which enables them to generate pressures as high as 10,000 psi without loss of mechanical efficiency. The pump is well illustrated showing all construction parts and its principle of operation. Safety relief valves, high pressure 4-way valve, high pressure check valve and pilot operated check valve are also described, sizes and pressure ranges tabulated. Power packages shown in this brochure are suitable for a wide range of hydraulic power requirements.

Circle No. 105

## Servos

***REMOTE CONTROLS . . .*** for controlling hydraulic valves, winches, charging cranes, slitting machines and other remote control uses are shown in a bulletin available from Trimount Instrument Company, Crown Control Division. Graphs and specification point out some improvements made on the MAT type. Also shown in the bulletin is complete data on the MAR type control which is a gravity feed unit.

Circle No. 106

***HYDRAULIC SERVO ACTUATOR . . .*** offers control system engineers a packaged, linear actuator with good performance. Technical bulletin No. 116-A prepared by Pegasus Laboratories, completely describes the operation and characteristics of the unit. Many diagrams such as typical test circuit block diagram, actuator phase lag, actuator transfer function, and differential current output rate vs input current are included. A hydraulic servo transmission system designed to provide remote position control for test facilities, remote manipulation, process control is also included together with installation drawings.

Circle No. 107

***HYDRAULIC TRACER . . .*** for general machine tool applications is explained and illustrated in a folder released by True-Trace Corp. Model a-3D is a precision stylus operated multiple hydraulic servo valve which controls the flow of oil to and from each end of three

hydraulic cylinders, two of which are mounted horizontally with piston rods at 90 degrees to each other, the third of which is mounted perpendicular to the plane of the other two cylinders. Design, operation and special features of the unit are fully described.

Circle No. 108

# System Plumbing

***PRESSURE PLUGS . . .*** with fully formed threads for positive sealing are described in a new catalog. Prepared by Standard Pressed Steel Co., the 32 page brochure details the company's line of socket head screws, self-locking set screws and other precision threaded fasteners. The catalog shows photographs of all products listed, applications are indicated in line drawings and cut away drawings emphasize special features. An easy-to-read table details dimensions of each product and diagrams keyed to the specification tables simplify the measurement references.

Circle No. 109

***PLASTIC CAPS AND PLUGS . . .*** for threads, pipe and tubing ends, are used as shipping protectors and seals against dust and moisture. A 12 page booklet has been released by CaPlugs, Division of Protective Closures Co., Inc. Tables are included which show all dimensions for the various types. Other products included are caps for electrical connectors, threaded plugs for aircraft and hydraulic tube fittings, flange protector caps and sleeve caps for tubing.

Circle No. 110

***AIRCRAFT HOSE AND HOSE ASSEMBLIES . . .*** for use in oil, hydraulic and fuel systems are described in a 16 page catalog published by Resistoflex Corporation. Also featured are high temperature, extra light weight, chemically inert, corrosion-proof hose and assemblies for aircraft and special industrial use. The catalog gives sizes, operating data, construction features, servicing information and a table of standard fittings.

Circle No. 111

***SELF-SEALING HYDRAULIC COUPLERS . . .*** for use on any hydraulic system regardless of high pressure, are illustrated in a 4-page bulletin. These couplers, manufactured by Pioneer Hydraulics, Inc., are of the "Quick" and "Break-Away" types, feature swivel action. Couplers maintain full free flow of fluid with minimum turbulence; the ball checks are held exactly in the center of the line of the coupled position. Sizes and applications for each type coupler are given and their prices listed.

Circle No. 112

***PROTECTIVE CLOSURES . . .*** for use on hydraulic lines and assemblies when handling, shipping and storing is described in a new plastic bound 14 page catalog containing specifications and prices. The catalog may be obtained from Tubing Seal Cap, Inc.

Circle No. 113

***2 PIECE REUSABLE COUPLINGS . . .*** for one wire braid cotton cover hydraulic hose. Particularly helpful for on-the-job replacements and for emergency repairs, as no special tools are needed. Hose does not have to be stripped, just inserted into the coupling body. Four operations are required to make a proper installation. Bulletin No. 105, released by Eastman Manufacturing Company, shows how this is done, step by step. The various coupling catalog numbers are listed in a chart which gives thread sizes, hose catalog number, id and od of hose, minimum bending radii, maximum psi and maximum burst pressure.

Circle No. 114

***RE-USABLE COUPLINGS . . .*** for medium-high and high pressure service, which feature a double-wedge grip, are described in Bulletin H-100 offered by Joy Manufacturing Company. The double wedge grip permits assembly on rubber covered hose without skiving. Through use of a special slotted bushing it is possible to retighten the coupling on the hose without disassembly when and if it comes loose through vibration or flexing No special tools are required for assembling couplings on hose.

Circle No. 115

***TUBE FITTINGS . . .*** A comprehensive 76 page catalog, 4300, published by The Parker Appliance Company, lists steel, brass, stainless steel, aluminum leakproof tube fittings and tube fabricating equipment. Beautifully illustrated, the catalog is divided into several parts, presenting 3-piece flare fittings, flareless fittings, pipe fittings, tube cutters and others. Each section is fully illustrated, giving complete specifications and engineering data of components described. The catalog includes tube bending and flaring instructions, tubing selection data and recommendations for wall thickness of tubing for various pressures and types of service.

Circle No. 116

***BALL BEARING SWIVEL FITTINGS . . .*** which range in size from ⅜ to 1 inch and from working pressures of 6,000 psi at 225 degrees F to 1,250 psi at 750 degrees F, are outlined in a bulletin issued by Emsco Manufacturing Company. Covering the HP and HT types, the literature describes method of construction and application of these fittings. Illustrated with many sectional drawings, it gives complete dimensions, specifications, weights and engineering data.

Circle No. 117

***TUBE WORKING TOOLS . . .*** A new pocket size catalog providing condensed listings of the complete line of tube working tools of The Imperial Brass Mfg. Co. is available. Included in booklet No. 3030 are all of the tools for cutting, flaring, bending, swedging, reaming and pinch-off of tubing. Test plugs and tools for refacing flared fittings are included. Tools for copper, aluminum, steel and stainless steel tubing are also shown. Flaring tools are listed in both 45 and 37 degree types.

Circle No. 118

***SELF-SEALING COUPLINGS*** . . . for hydraulic pressure lines of up to 3000 psi are detailed in an eight page catalog issued by Dowty Hydraulic Units, Ltd. Graphs produced from figures obtained under actual working conditions show that these couplings have a minimum pressure loss. Sizes and installation data, and sectional drawings are given.

Circle No. 119

***HOSE COUPLINGS*** . . . designed for one-hand operation are described in a new brochure prepared by Breco Manufacturing Co., Inc., Division of Perfecting Service Company. The bulletin, 54-1R, shows a variety of styles and types of couplings featuring quick connect-disconnect operation without turning or twisting to lock, just push in. Automatically locks, making high pressure leakproof connection. Integral check valve automatically shuts off line or hose pressure when disconnected, prevents danger of backlash or whipping. Couplings can be used for applications up to 10,000 psi.

Circle No. 120

***PUSH TYPE QUICK COUPLERS*** . . . which employ the one hand connect and disconnect principle are covered in True Flate's, Inc., No. 4 catalog. Available in two body sizes with pipe threads from ⅛ to ½ inch, the coupler's working parts are of case hardened steel. This catalog also contains information on sleeve type ball locking couplers engineered to provide a maximum flow of air with minimum line pressure drop. All units are illustrated, diameter and thread sizes listed.

Circle No. 121

## Valves

***HYDRAULIC VALVES*** . . . which are solenoid operated and sub-plate mounted are described in an 8 page catalog No. 260, offered by Rivett Lathe & Grinder Inc. Featured are J.I.C. diagrams showing flow operations under all types of action for each one of the fourteen piston designs. Also highlighted are cut-a-way illustrations showing shock resistant spool design.

Circle No. 122

***SOLENOID VALVES*** . . . New bulletin A-3 describes and illustrates additions to the line of general service solenoid valves manufactured by J. D. Gould Co. Included in the models are normally closed or normally open types in three sizes, 1" 1-¼" and 1-½". Designed to eliminate hammer and shock in automatic or remote control of liquid flow, air or gas.

Circle No. 123

***FLUID CONTROLS*** . . . Catalog 2A, containing 62 pages, has recently been released by Hoke, Inc., covering the products which they manufacture. The controls presented are, needle valves, toggle valves, packless valves, needle valve controls, pressure regulators, accessories and fittings, stainless steel cylinders, flo-gages and oxy-gas torches. Each of these products is handled in the catalog as a separate section. Very complete information is contained in the catalog, answering questions on thread sizes, connection sizes, styles, materials, specifications and applications.

Circle No. 124

***HYDRAULIC CONTROL VALVES*** . . . Eight new hydraulic control valves with ball detent for position locking are discussed in catalog sheets, a section of Catalog No. 200, issued by Logansport Machine Company. Included are six 3-position, 4-way valves and two 2-position 4 and 3-way valves.

Circle No. 125

***AIR RELEASE VALVES*** . . . manufactured by The V. D. Anderson Co., are described in condensed bulletin No. 654. The data sheet gives complete information on three different styles of air release valves used for venting air from liquid lines and tanks under pressure. Also included is a capacity table showing the cubic feet of free air handled by various valves at different operating pressures.

Circle No. 126

***HYDRAULIC VALVES*** . . . for high pressure, large press applications requiring accumulator station control are featured in literature issued by Lombard Corporation. All valve bodies are of forged carbon steel for the standard valves for normal service. The catalog gives complete engineering data, diagram drawings and sizes of throttle and shut-off valves, filling valves and control valves. Special valves and accumulator controls are also detailed.

Circle No. 127

***SAFETY AND RELIEF VALVES*** . . . Kunkle Valve Company completely describes and catalogs the various units available in catalog 53. The 52 page booklet is fully illustrated. All information pertinent to the product is included. Cross section views show construction of the valves and arrangement of component parts.

Circle No. 128

***FLOW REGULATORS*** . . . The combination by-pass and restrictor type flow regulator is used to maintain a constant flow when pump output varies or is greater than required for part or all of the system. They can be used in series to divide the pump output into two or more regulated flows and by-pass the excess. Available in sizes ¼, ⅜ and ½ in pipe. Sheets No. 3.40, 3.41a and 3.42, released by Fluid Controls, Inc., give complete dimensional and application data.

Circle No. 129

***HYDRAULIC RELIEF VALVES*** . . . By-pass, piston type, oil-relief valves for use with oil hydraulic pumps where specific pressure must be maintained. The Fulflo Specialties Co. Inc., has released a 4 page bulletin in color describing these valves. The models available are equipped with one of five different springs, for pressure selections from 0 to 500 psi. Pipe sizes are ¼ in to 2 in. Cross-section views show construction of the valve.

Circle No. 130

***DIRECTIONAL CONTROL VALVES . . .*** built for pneumatic and hydraulic applications are illustrated in Ledeen Manufacturing Company's 16 page catalog. Described are hand, foot, power and solenoid operated valves. Dimensions and weights, application diagrams, circuit diagrams are clearly shown for each type of valve. All have rotating disc construction, chrome plated surface in body, integral disc and stem. The bulletin includes a parts and accessory list.

Circle No. 131

***CONTROL VALVES . . .*** for pneumatic or hydraulic application are described in a 52 page catalog, released by Marotta Valve Corp. Included in the catalog are valves for aircraft, guided missiles, automotive and industrial uses. Book is divided into sections on magnetic, check, regulating and special valves. Complete line is included, with large detailed illustrations of each valve, applications, specifications, installation drawings and flow curves.

Circle No. 132

***DIRECTIONAL AND FUNCTIONAL VALVES . . .*** for oil hydraulic service of 3000 psi are completely described in catalog No. 841, made available by Hydraulic Power Division, The Hydraulic Press Mfg. Co. Many 4-way valves are illustrated and described including cam operated, single solenoid, integral pilot, double solenoid, pilot operated, air pilot operated, 2-way valves, cam operated, single solenoid and pilot operated, rotary pilot valves, relief, sequence and pressure reducing valves. Many more types are included. All are well illustrated. Installation dimensions are given for the sizes listed. A section of the catalog is devoted to subplates, both with straight and side outlets.

Circle No. 133

***HYDRAULIC PRESSURE REDUCING VALVES . . .*** designed for aircraft and industrial uses, are described in a bulletin offered by GAR Precision Parts, Inc. Available in ¼ and ⅜ in od ports, they can be obtained from stock in either 1500 or 3000 psi. These lightweight valves are free of "chatter" and "whistle" at reduced pressures.

Circle No. 134

***HYDRAULIC AND PNEUMATIC CONTROLS . . .*** are presented in catalog 4G available from Barksdale Valves. Manual valves, solenoid valves, solenoid pilot controlled valves and pressure switches are incuded in the booklet. Many models of the above types are also illustrated. The 36 page catalog is in color. The valving principle is explained. Each of the valves presented are illustrated by cross-section views and flow patterns. Valve characteristics are shown together with port size, minimum flow passage, rated flow at 20 fps velocity. The solenoid valve data includes port size and electrical ratings. A pressure switch selection chart guides step by step the selection of the proper switch. Operating characteristics are shown for the pressure switches.

Circle No. 135

***FLOW CONTROL VALVES . . .*** and direct operating pressure controls are described in a new 4 page, three color catalog, released by The Denison Engineering Company. The flow control valve may be quickly reset for more than one application without making changes in spools. It has an adjustable orifice principle which provides a means of adjusting the spool position.

Circle No. 136

***SELECTOR VALVES . . .*** for 2-way, 3-way and 4-way usage are described in bulletin No. 754, available from Republic Manufacturing Co. Supplied in six sizes from ⅛ in to 1 in pipe or tube, these valves require no lubricant and are suitable for temperatures from –65 F to 250 F. Working pressure of 100 psi is recommended for air, oil or water. The body is available in either aluminum or stainless steel. An illustration and adequate description is included for each type.

Circle No. 137

***AUTOMATIC CONTROLS . . .*** A folder on automatic controls that can be adapted to manually controlled hydraulic compression presses, batch process machinery or where cyclical operation is required, is available from the Seely Instrument Co., Inc. It describes the applications for timers, temperature and pressure controls and air diaphragm motor valves, that can be arranged singly or in any combination to offer semi or fully automatic operation of present machinery. This folder will prove of value to those interested in tire and tube molding, molding of plastics, phonograph record pressing, metal extrusion and similar industries.

Circle No. 138

***HYDRAULIC CONTROL VALVES . . .*** Pantex Manufacturing Corporation has released new bulletins on 100-5000 psi valves. The subject of bulletin AD is relief valves (Cartridge type unit) 350-5000 psi; bulletin 25, ¼ in directly operated 4-way valves, solenoid controlled, 100-5000 psi; bulletin 55, ¾ in pilot operated 4-way valves, solenoid controlled, 100-5000 psi; bulletin 57, ¾ in pilot operated 4-way valves, remotely controlled, 100-5000 psi. Installation dimensions are shown for each of the sizes available. Complete dimensional information is given on the installation drawings. Similar information is given for both solenoid and remote controlled pilot operated valves.

Circle No. 139

***SOLENOID VALVES . . .*** for oil and air operation are designed for pressures to 5000 psi at 150 F and 2500 psi at 450 F. Bulletin HP201, released by Atkomatic Valve Company, Inc., illustrates features of the high pressure pilot operated and direct life solenoid valves, with diagrams of electrical circuits used for normally open, and normally closed operations. A cross sectional drawing shows the construction of the valve. A table shows for each pipe size, the orifice, psi, temperature and material.

Circle No. 140

***VALVES AND FITTINGS . . .*** manufactured by the Kohler Co. are described and illustrated in a new 20 page catalog. It features hydraulic check valve, hydraulic relief valve, hydraulic restrictor valve, pneumatic check valve, swing check valve, needle valve and plug valve. All the controls are shown in diagram drawings, sizes and engineering data is tabulated.

Circle No. 141

***AIR AND HYDRAULIC VALVES . . .*** Several bulletins have been issued by Beckett-Harcum Company, covering these products. Bulletin No. 101 and 102 presents the air valves and bulletin No. 103 and 104, the hydraulic valves. Each of the bulletins give features and specifications. Directional flow and a flow chart are included. Solenoid current characteristics, solenoid specifications, parts lists and a cross-sectional views of the valves are also included.

Circle No. 142

***AIR VALVES . . .*** are the subject of a comprehensive 44 page catalog, No. 51, published by Ross Operating Valve Company. Among the many standard types illustrated and described are hand, foot, cam and solenoid valves, master valves for remote control operations, and small valves for pilot control with hand, foot, cam or solenoid operation. Also shown are speed control and other special purpose valves. Sectional drawings detail construction features of each type valve. Several pages are devoted to general reference data and installation diagrams.

Circle No. 143

***FLUID POWER DEVICES . . .*** including cylinders, valves and packaged units are briefly described and illustrated in a 4-page bulletin published by Modernair Corporation. All the units featured in this literature are fully described in individual brochures available upon request. Highlights of the company's facilities are included. One page pictures and describes typical applications of components made by Modernair.

Circle No. 144

***SOLENOID PILOT OPERATED VALVE . . .*** An air-control valve built to meet J.I.C. standards is described in Valvair bulletin SKJ-54. The design is simple, having only two moving parts; a single spool type stem in the main valve body and the plunger in the pilot. Recommended pressures are from 35 to 200 psi for air and low pressure hydraulics. Available in 2-way, 3-way, 4-way and 4-way-5-port models with either fast mounting or sub-base manifold mounting in the 3-way and 4-way valves.

Circle No. 145

***SOLENOID VALVES . . .*** Pilot pressure equal to operating line pressure is employed to shift the valve spool, thus permitting use of a small, continuous duty solenoid directional valve and eliminating need for large expensive, directly connected solenoid actuators. The valve may be used as a three-way, two three-way, two two-way combinations at pressures not exceeding 200 psi. Cross-section views aid in showing construction of the valve and its operation. Also line drawings show all dimensions necessary for installation purposes. Ask for SEC 11-A-24 released by Modernair Corp.

Circle No. 146

***HYDRAULIC CONTROL VALVES . . .*** Dimensional data and features of directional valves for mobile equipment applications, covering 1, 2, 3, and 4 spool models from 8-35 gpm capacity, are provided in a new 10 page catalog file published by Industrial Hydraulics Division, The Parker Appliance Company.

Circle No. 147

***AIR CONTROL VALVES . . .*** A 66 page catalog completely describing the line of Airmatic Valve, Inc., is now available. The catalog gives all pertinent information for 2-way, 3-way and 4-way valves and for the following types: cam, flow control, foot, hand, interlock, pilot, pressure regulator, quick exhaust, sequence, solenoid, and time delay. Also presented are air and hydraulic cylinders. Information on size, pressures, features, applications, parts lists, mounting dimensions and cross-sectional views are given for each valve presented. Similar data is given for the cylinders.

Circle No. 148

***FLOW CONTROL VALVES . . .*** A new 4 page two color bulletin 53-35, describing these valves for machine tool and welding machine oil hydraulic systems, may be obtained from Vickers, Inc. Flow control circuits, performance curves, installation data and complete specification tables are given. Gasket mounted valves in a series of models for ¼, ⅜, ¾ and 1¼ in standard pipe sizes are presented. One-quarter in size valves with integral check valve for reverse free flow are discussed.

Circle No. 149

***BLEEDER VALVE . . .*** which is semi-automatic and makes bleeding of air from hydraulic systems a fast fingertip operation is described in a bulletin released by Greer Hydraulics, Inc. The ease of operation is illustrated. Cross-section views show the construction of the valve. All dimmensions and part nomenclature are shown on drawings. Other uses including the dumping of air pressure in pneumatic systems are discussed. How it works, features, specifications are covered. Valve will withstand pressures up to 20,000 psi.

Circle No. 150